(12) UK Patent Application (19) GB (11) 2 261 203 (13) A

(43) Date of A publication 12.05.1993

(21) Application No 9123768.5

(22) Date of filing 08.11.1991

(71) Applicant
Keith Raibert Sherriff
45 Leopold Street, Leeds 7, LS7 4DE, United Kingdom

(72) Inventor
Keith Raibert Sherriff

(74) Agent and/or Address for Service
Keith Raibert Sherriff
45 Leopold Street, Leeds 7, LS7 4DE, United Kingdom

(51) INT CL[5]
B64C 29/00 // B64C 17/02

(52) UK CL (Edition L)
B7W WPF W601
B7G GCG

(56) Documents cited
GB 0865568 A GB 0846300 A GB 0828884 A
GB 0731413 A

(58) Field of search
UK CL (Edition K) B7W WBCB WPF
INT CL[5] B64C 27/22 27/26 29/00
On-line database: W.P.I.

(54) VTOL Aircraft

(57) In a VTOL light aircraft, two variable pitch rotors are housed one behind the other within the fuselage to draw air through front intakes and through intake louvres in the top of the fuselage, and expel it through controllable flaps in the bottom of the fuselage and/or through a rear exhaust nozzle. The rotors are inclined to the fuselage horizontal plane and rotate in opposite directions. In the hover, yaw control is by vanes in the exhaust nozzle (Fig 9) and lateral control by a weight movable spanwise within the wing. (Fig 10), while differential pitch control of the rotors is used for pitch control of the aircraft. The pilot lies in a prone position.

FIG 3

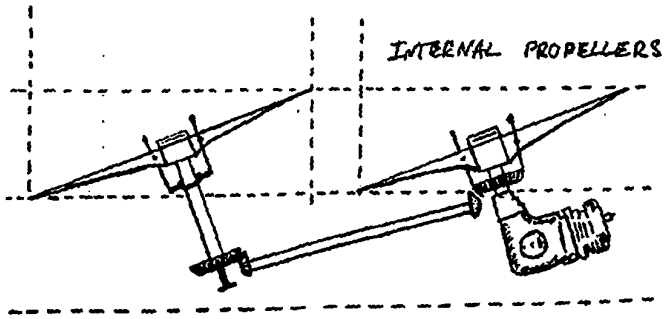
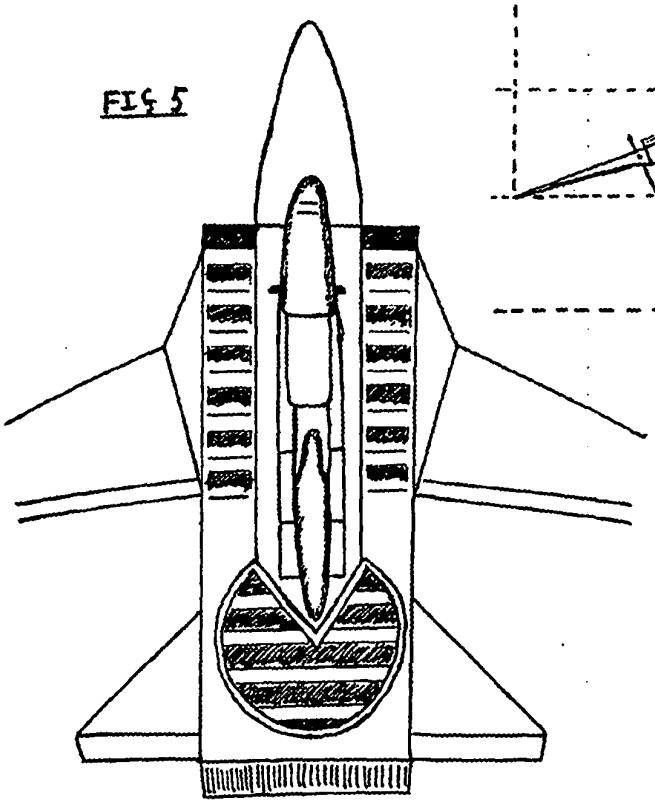


FIG 5



At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1990.

GB 2 261 203 A

UPPER AIR INTAKE PANEL

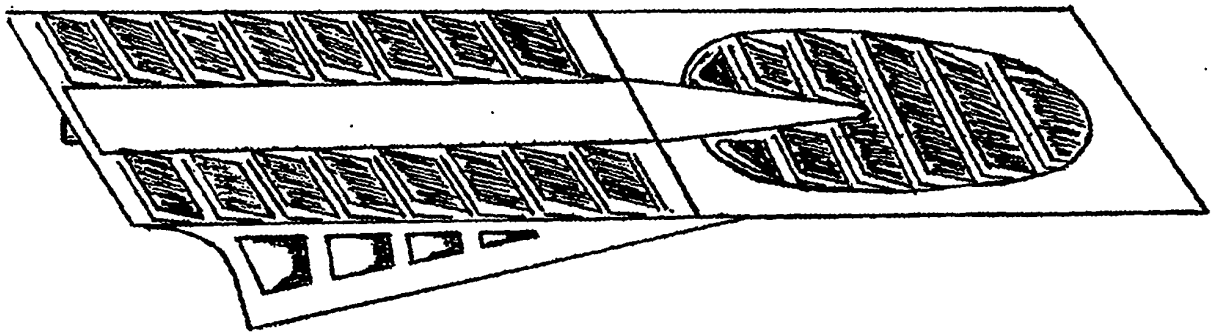


FIG 1

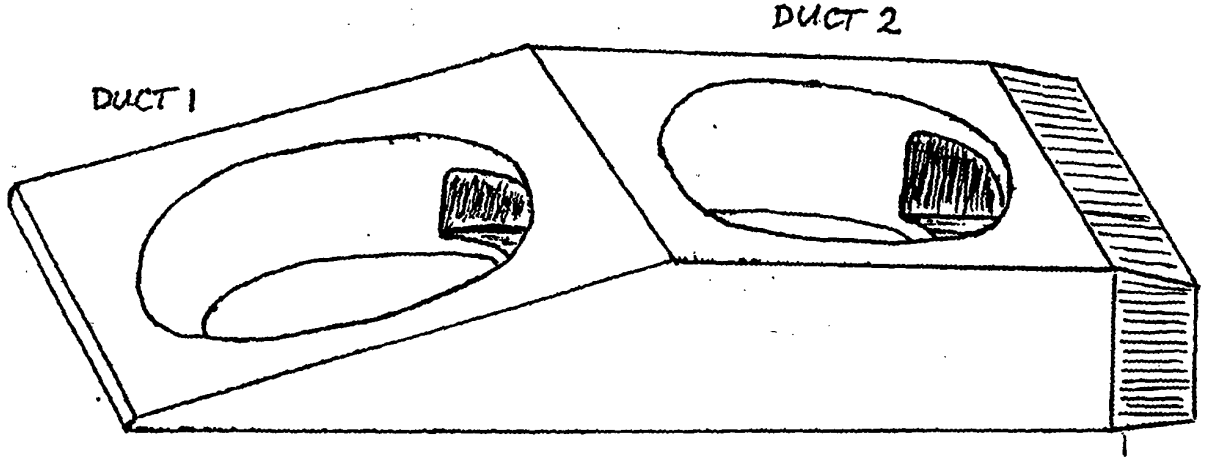


FIG 2

DUAL DIRECTIONAL DUCT

FIG 3

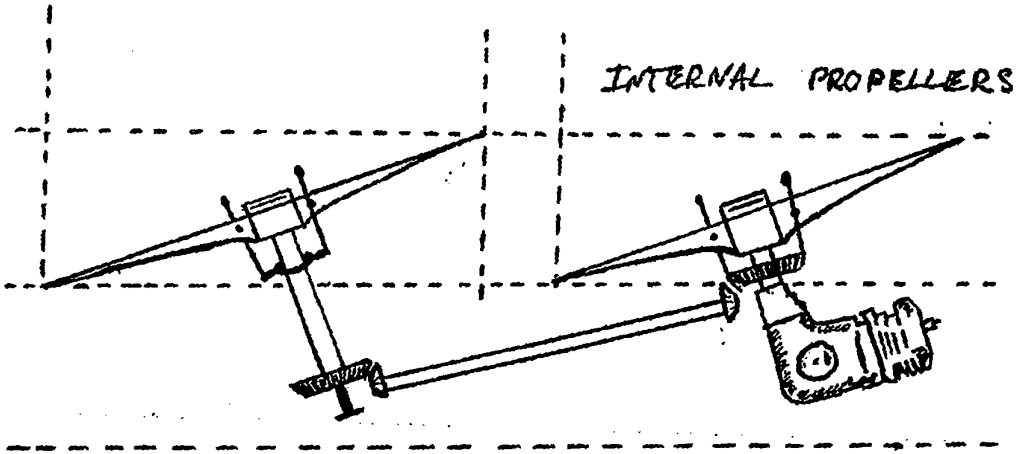


FIG 3

FIG 4

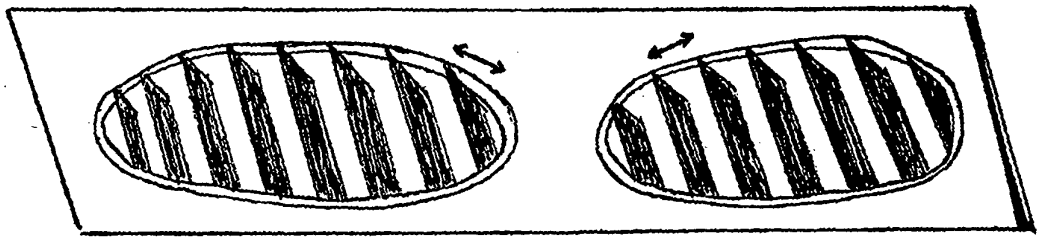
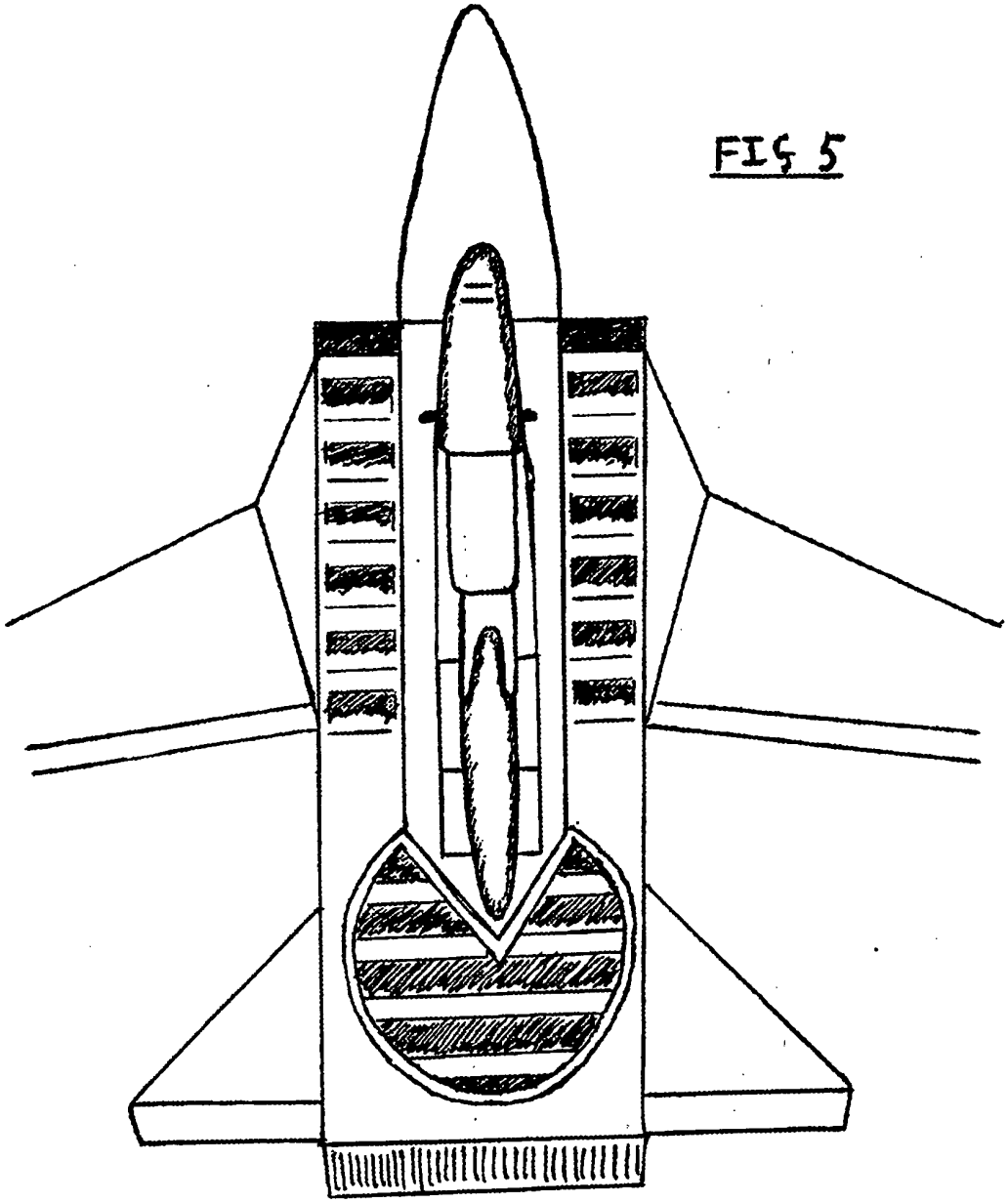


FIG 4

FIG 5



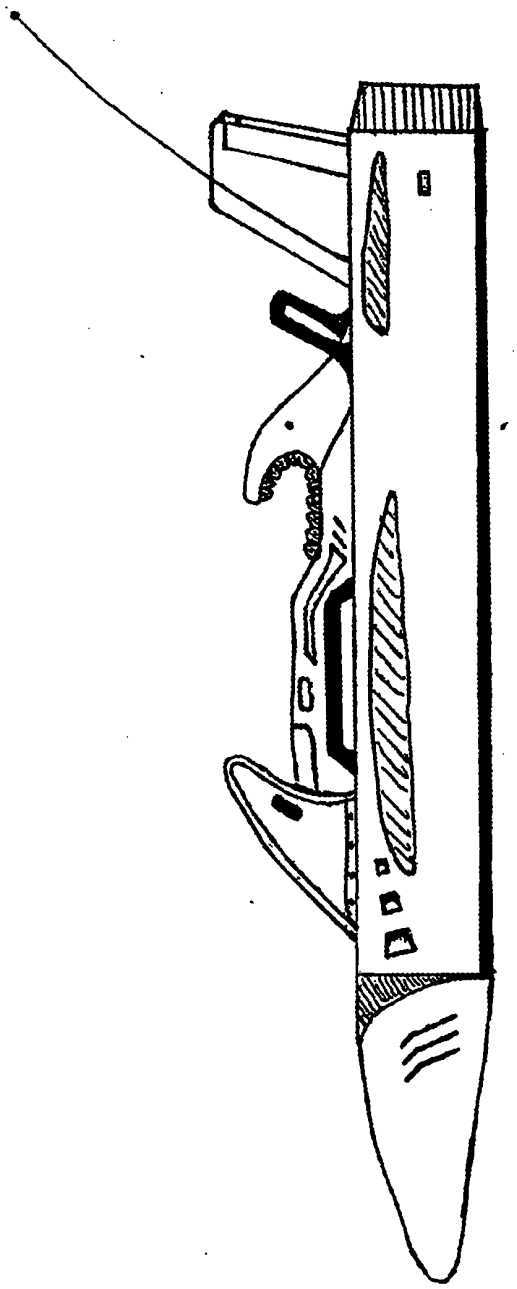


FIG 6

FIG 7

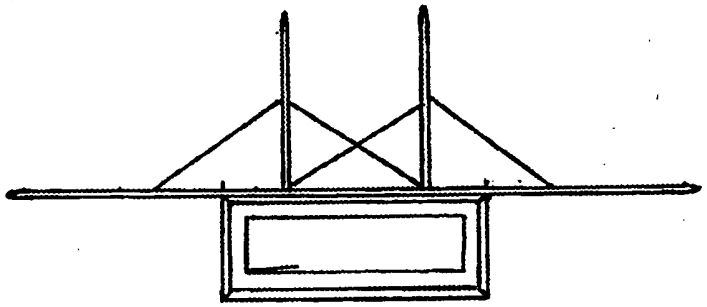
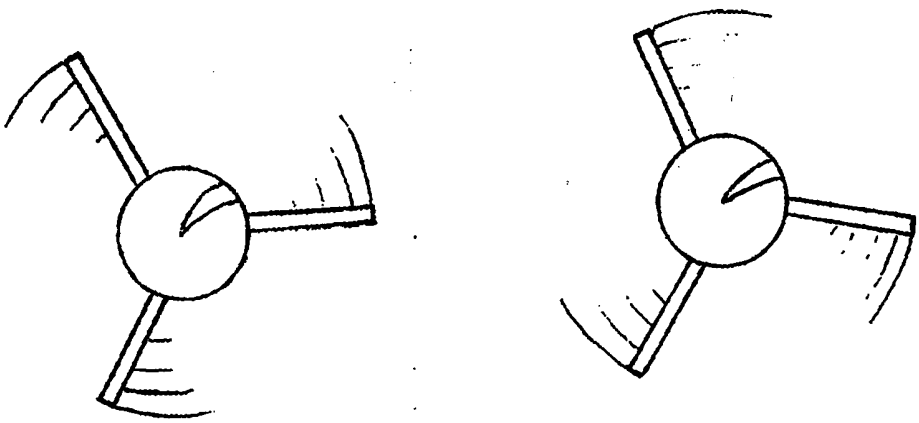


FIG 8



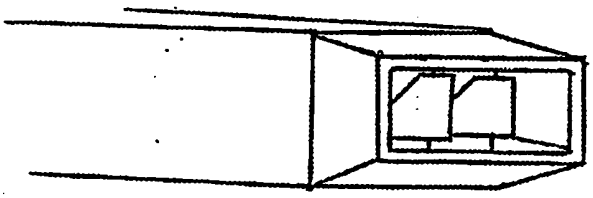


FIG 9

RUDDER

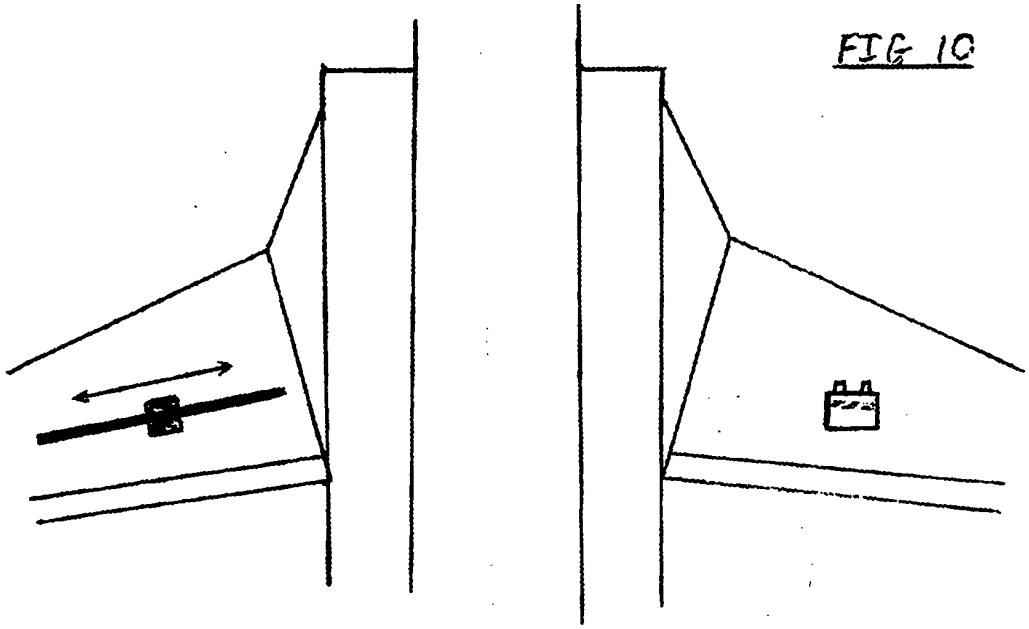


FIG 10

BUILDING THE KRS 3 AIR CRAFT

To date I have seen jet skis, snow bikes and motorbikes all of which have to be mounted by the user to cross land, snow, or water. In March 1990 I gave myself a challenge to design a low altitude craft which could be mounted and take to the air. The craft by design should be able to fulfil the following requirements: take off and land vertically; it should not have any outward rotors or hot exhaust emissions from jet combustion chambers unless for military use; it should be cheap, light, quiet, easy to control, clean, efficient and safe; its size should be sufficient to accommodate a single rider.

After several pilot designs and early models, one design was chosen that would best fulfil the listed requirements. This selected design employs the ducted fan principle of suck and blow. Flight is achieved by the use of two, variable pitch, internal rotors which travel in opposite directions to counteract the effects of yawing when accelerating. The rotors are fixed in a series-parallel configuration which allows for vertical take off and land, whereas horizontal flight is achieved by adjusting shutters which directs the air flow through a series of ducts to produce forward thrust. Altitude can then be maintained by the wings and stabilizers once the minimum cruising speed is reached. Its size and aerodynamic styling should ensure its ability to glide through the air with the grace of a microlite. Only then can I claim to have found the missing link between the motorbike and the aeroplane.

At present I am building a model of the chosen design which looks very promising, and seeking technical advice in a range of areas before building a life size machine(s) which should have a range of applications for defence, emergency services, films, advertising and pleasure.

There is no doubt about my intentions to pursue this project to the end with a sense of pride, not only for myself, but more so knowing that it is British.

CLAIMS:

The way in which the KRS-3 is mounted is specifically designed centrally, to allow air to enter the front, rear and both sides of the upper air intake panel FIG.1, unless to be used by more than one person. The pilot's body lays along the length of the craft. This not only helps to balance the craft, but is the most aerodynamic posture given the craft's design FIG.6. The "C" shaped seat as well as safety belts, keeps the pilot safe, whether the central mount is enclosed or not.

During operation both internal propellers FIG.3 are rotated in opposite directions by one or more engines with the appropriate coupling FIG.3.

In vertical flight, air is drawn into the craft by the propellers FIG.3, through the upper air intake panel FIG.1, then vertically through the dual directional Ducts 1 and 2 FIG.2, then out of the under flap FIG.4, which is fully open. To make the craft yaw whilst hovering, rudders are adjusted at the back of the craft FIG.9. This works due to the spillage of air caused by the down draft of the rear propeller FIG.3, Duct 2. The craft is made to roll whilst hovering, by adjusting weights which are made to travel along the length of the wings FIG.10. To make the aircraft pitch whilst hovering, the pitch of both propellers will be made to be adjusted independently FIG.3. Vertical flight is achieved by the series configuration of the propellers.

In horizontal flight, air is drawn into the craft through the upper intake panel FIG.1 by the propellers FIG.3. The under flap FIG.4 is fully closed. The forward tilt of both propellers FIG.3 of up to thirty five degrees allows air to flow horizontally from primary Duct 1 to secondary Duct 2 FIG.2. The combined force of air pressure expelled at the back of the craft FIG.9 by both propellers FIG.3, given their pitch and R.P.M., will provide forward thrust, then flow through to conventional flight and controls. Horizontal flight is achieved due to the parallel configuration of the propellers FIG.3.

3

Patents Act 1977
Examiner's report to the Comptroller under Section 17 (The Search Report)

Application number
GB 9123768.5

Relevant Technical fields

(i) UK Cl (Edition K) B7W-WPF,WBCB

(ii) Int Cl (Edition 5) B64C-29/00,27/22,27/26

Search Examiner
B F BAXTER

Databases (see over)

(i) UK Patent Office

(ii) ONLINE DATABASE: WPI

Date of Search
20 NOVEMBER 1992

Documents considered relevant following a search in respect of claims

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
A	GB 0865568 (SMITH) whole document	The claims
X	GB 0846300 (BOULTON PAUL AIRCRAFT AND ARMSTRONG SIDDELEY) note Figures 3 and 4	The claims
A	GB 0828884 (BOULTON PAUL AIRCRAFT) note fans 6, 7	The claims
A	GB 0731413 (GOODYEAR AIRCRAFT) whole document	The claims

Category	Identity of document and relevant passages	Relevant to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.

A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

&: Member of the same patent family, corresponding document.

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). Th on-line databases considered for search are also listed periodically in the Official Journal (Patents).

Published 1993 at The Patent Office, Concept House, Cardiff Road, Newport, Gwent NP9 1RH. Further copies may be obtained from Sales Branch, Unit 6, Nine Mile Point, Cwmfelinfach, Cross Keys, Newport, NP1 7HZ. Printed by Multiplex techniques ltd, St Mary Cray, Kent.